REMARKS

Applicant intends this response to be a complete response to the Examiner's **23 December 2008** Final Office Action. Applicant has labeled the paragraphs in his response to correspond to the paragraph labeling in the Office Action for the convenience of the Examiner.

DETAILED ACTION

Response to Amendment and Arguments

The Examiner states as follows:

1. Applicants' amendment filed on October 3, 2008 has been entered and made of record.
2. In view of Applicants' amendments, the claim objections are withdrawn.
3. In view of Applicants' amendments, the 112 first and second paragraph rejections are withdrawn.
4. Applicant's arguments with respect to the rejected claims have been considered but are moot in view of the new ground(s) of rejection.

Applicants acknowledge the Examiner's statement.

Requirement for Information under 37 CFR 1.105

The Examiner states as follows:

5. Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

In response to this requirement, please provide copies of each publication which any of the applicants authored or co-authored and which describe the disclosed subject matter of constructing an isotropic ideal window/filter using isotropic scaling functions and associated translation operators.

In addition, please provide the title, citation and copy of each publication that any of the applicants relied upon to develop the disclosed subject matter that describes the applicant's invention. **In particular, Examiner requests a copy of each of the publications cited by the article "Non-separable Radial Frame Multiresolution Analysis in Multidimensions and Isotropic Fast Wavelet Algorithms" by Papadakis et al.** For each publication, please provide a concise explanation of the reliance placed on that publication in the development of the disclosed subject matter.

First, Applicants note that a pre-print of the requested article was Attachment A of the provisional application. Applicants expound upon this point herein. Applicants are providing copies of certain Papadakis et al. references at this time, but some of the references cited in the specification were only for background, are not relevant for examination and are not readily available – some are books on the back subject of multi frame analysis. If there are specific references that the Examiner needs, Applicants will indeed track the article down.

Specification

The Examiner states as follows:

6. The specification is objected to because pages 26-27 contain a list of publications cited by the specification. According to the MPEP § 609 A(l) "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, Examiner suggests Applicants file

a separate information disclosure statement following the requirements of 37 CFR 1.98(b), which requires a list of all patents, publications, or other information submitted for consideration by the Office.

Applicants are attempting to comply with this request, however, some of the references cited are books. Applicants will not be able to submit the book. However, many of these references are not germane to the subject matter being claimed, but is simply background information. Applicants are submitting some of the inventors references cited in the application at this time. Applicants will attempt to obtain copies of other references.

Claim Rejections - 35 USC § 101

The Examiner contends as follows:

7. **Claim(s) 1-6,.13-18** stands/stand rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Federal Circuit precedent (*In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008)) requires that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process under 35 U.S.C. 101. (Claim 15's recitation of a computer does not make the claim statutory because the computer is recited in the preamble and therefore, not given patentable weight.)

Claims 13-14 are further rejected under 35 U.S.C. 101 because the claims do nothing more than solve mathematical problems. See MPEP 2106.02.

Applicants have amended claim 1 to recite that the method is to be implemented on a computer. The method is implemented on a compute, where the step produce a computer platform which can be used to resolve or decompose multidimensional signals, data, information, or images into a plurality of non-overlapping subsets or resolution levels improving analysis efficiency and improving analysis of more complex multidimensional signals, data, information or images. Thus, not only is the method to be implemented on a computer, the method does indeed transform its input, which can be a multidimensional signal, dataset, information, or image, into a plurality of non-overlapping subsets or resolution levels. These subsets and resolution levels are filtered set derived from the original data through the application of the wavelets and filters. The resolved or decomposed signal, data, information or image has been fully transformed in the manner similar to a Fourrier analysis, LaPlacian analysis or other signal analysis. Applicants, therefore, respectfully request withdrawal of this rejection.

Claim Rejections - 35 USC § 102

8. **Claims 1-11, 14-16** stand rejected under 35 U.S.C. 102(a) as being anticipated by the article

entitled "Non-separable Radial Frame Multiresolution Analysis in Multidimensions and Isotropic Fast Wavelet Algorithms" by Papadakis et al. (hereinafter Papadakis).

The Examiner contends as follows:

> Referring to claims 1-11, 14-18, Papadakis discloses the claimed features on pages 1 through 8. (The Applicants have failed to meet the requirements set forth in the previous Office action to overcome the 35 USC 102(a) rejection. In particular, Applicants have failed to show how each limitation recited in the claims are sufficiently supported by the provisional application according to 35 USC 112 first paragraph.)

First, the Papadakis paper cited by the Examiner is a published version of Attachment A of the provisional application. Attachment A is a pre-published form of the paper that later appeared in "Applications in Signal and Image Processing X." Edited by Unser, Michael A.; Aldroubi, Akram; Laine, Andrew F. *Proceedings of the SPIE*, Volume 5207, pp. 631-642 (2003).

Although the entire content of the Papadakis paper formed the supporting disclosure of the provisional application, Applicants include a table evidencing support from the provisional on a claim by claim, element by element basis:

1 A method for frame multi-resolution analysis implemented on a computer comprising the steps of:	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.
constructing isotropic, non-separable ideal windows in a dimension greater than or equal to 1,	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
constructing translation and dilation operators for the windows;	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
constructing isotropic, non-separable filters from the ideal windows, the translation operators and the dilation operators, where the filters are selected from the group consisting of isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of desired frequency ranges;	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
constructing isotropic, non-separable scaling functions and associated translation operators for use with the isotropic, non-separable scaling functions; and	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
producing associated isotropic, non-separable wavelets from the isotropic, non-separable filters and the isotropic, non-separable scaling functions, where the wavelets and filters are adapted to resolve or decompose multidimensional signals, data, information, or images into a plurality of non-overlapping subsets or resolution levels improving analysis efficiency and improving analysis of more complex multidimensional signals, data, information or images.	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
2. The method of claim 1, further comprising the step of:	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.

dividing each filter into at least one relative low pass component and at least one relative high pass components.	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
3. The method of claim 1, wherein the multidimensional signal is: a streaming video signal, a seismic imaging signal, a digital medical imaging signal, a satellite imaging signal, a surveillance imaging signal, a target acquisition imaging signal, a radar imaging signal, a sonar imaging signal, or a pattern recognition imaging signal.	paragraph [0007] and Attachment A.
4. A method for analyzing data implemented on a computer comprising the steps of:	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.
constructing at least one isotropic, non-separable wavelet including:	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
isotropic, non-separable filters having at least one ideal isotropic, non-separable window and necessary translation and dilation operators, where the filters are selected from the group consisting of low pass isotropic, non-separable filters, high pass isotropic, non-separable filters and isotropic, non-separable filters that cover a desired frequency range or plurality of frequency ranges;	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
isotropic scaling functions and associated translation operators for use with the scaling functions; and	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
resolving or decomposing multidimensional signals, data, information, or images into a plurality of non-overlapping subsets or resolution levels with the at least one isotropic, non-separable wavelet improving analysis efficiency and improving analysis of more complex multidimensional signals, data, information or images	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
5. The method of claim 4, further comprising the step of:	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.
dividing each isotropic, non-separable filter into at least one relative low pass isotropic, non-separable component and at least one relative high pass isotropic, non-separable components.	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
6. The method of claim 4, wherein the multidimensional signal is: a streaming video signal, a seismic imaging signal, a digital medical imaging signal, a satellite imaging signal, a surveillance imaging signal, a target acquisition imaging signal, a radar imaging signal, a sonar imaging signal, or a pattern recognition imaging signal.	paragraph [0007] and Attachment A.

7. A system for processing signals implemented on a computer comprising:	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.
a processing unit having encoded thereon a completely isotropic, non-separable ideal filter for frame multi-resolution analysis software including:	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
wavelets adapted to resolve a multidimensional signal into various resolution levels, where the wavelets are derived from:	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
isotropic, non-separable ideal windows or filters in a dimension greater than or equal to 1,	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
translation and dilation constructs or operators adapted to form completely isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of frequency ranges from the isotropic ideal windows into; and	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
isotropic, non-separable scaling functions and associated translation operators for use with the scaling functions;	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
where the system resolves or decomposes multidimensional signals, data, information, or images into a plurality of non-overlapping subsets or resolution levels with the at least one isotropic, non-separable wavelet improving analysis efficiency and improving analysis of more complex multidimensional signals, data, information or images.	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
8. The system of claim 7, wherein each isotropic, non-separable high pass and each isotropic, non-separable low pass filter comprise:	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.
at least one isotropic, non-separable relative low pass component and at least one isotropic, non-separable relative high pass component.	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
9. The system of claim 8, wherein each isotropic, non-separable relative high pass component and each isotropic, non-separable relative low pass filter comprise:	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.

at least one isotropic, non-separable relative low pass subcomponent and at least one isotropic, non-separable relative high pass subcomponent.	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
10. The system of claim 7, wherein each isotropic, non-separable high pass and each isotropic, non-separable low pass filter comprise:	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.
a plurality of isotropic, non-separable high pass and isotropic, non-separable low pass components, each component including at least one isotropic, non-separable relative low pass subcomponent and at least one isotropic, non-separable relative high pass subcomponent.	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
11. A completely isotropic, intrinsically non-separable low pass filter or high pass filter implemented on a computer comprising:	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.
isotropic, non-separable ideal windows in a dimension greater than or equal to 1, and	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
translation and dilation operators adapted to form out of the ideal windows completely isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of frequency ranges from the isotropic ideal filters.	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
12. The filter of claim 11, wherein the isotropic, non-separable low pass filter comprises:	Attachment A at page 27 below Figure 5.
$m_0(\xi) = \sqrt{2}\,\chi_{D1\sqrt{2}}(\xi),\ \xi \in \mathrm{T}^2$	Attachment A at page 27 below Figure 5.
13. A completely isotropic, intrinsically non-separable scaling function	Attachment A at page 15, second full paragraph.
implemented on a computer comprising:	
$\phi = F^{-1}(\chi_D)$	Attachment A at page 15, second full paragraph.
14. An isotropic, non-separable wavelet scaling function implemented on a computer comprising:	Attachment A at page 12 equation (7).
$\phi(R) = \dfrac{J_{n/2}(\pi R)}{(2R)^{n/2}}, \quad R > 0$	(7)
15. An isotropic, non-separable wavelet implemented on a computer comprising:	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
at least one isotropic, non-separable filter including at least one isotropic, non-separable ideal window and translation and dilation operators, where the filters are selected from the group consisting of isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of frequency ranges; and	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.

constructing isotropic scaling functions and associated translation operators for use with the scaling functions.	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
16. The wavelet of claim 15, wherein the wavelet further comprises:	Attachment A at bottom of page 16 through the top of page 17.
$h_r = e_q \chi_Q \quad r \in \{0,1,\ldots,p-1\}$	Attachment A at bottom of page 16 through the top of page 17.
where $\{e_{A(\mathbf{k})} h_r : \mathbf{k} \in \mathbf{Z}^n, r = 0,1,\ldots,p-1\}$ is a Parseval frame for $L^2(Q)$ and for $\hat{W}_{-1}$, $\{T_{A(\mathbf{k})} F^{-1} h_r : \mathbf{k} \in \mathbf{Z}^n, r = 0,1,\ldots,p-1\}$ frame for W_{-1}, $\psi_r = DF^{-1}h_r$ ($r = 0, 1, \ldots, p-1$), $\{T_k \psi_r : \mathbf{k} \in \mathbf{Z}^n, r = 0, 1,\ldots, p-1\}$ is a Parseval frame for W_0, and $\{\psi_r : r = 0, 1,\ldots, p-1\}$ is a Parseval frame multiwavelet set associated with the FMRA $\{V_j\}_j$.	Attachment A at bottom of page 16 through the top of page 17. is a Parseval
17. The method of claim 1, further comprising the step of:	
decomposing a multidimensional signal, data set, information, or image into a plurality of non-overlapping subsets or resolution levels using a plurality of isotropic, non-separable wavelets derived from the isotropic, non-separable filters and the isotropic, non-separable scaling functions.	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
18. The method of claim 17, further comprising the step of:	
forming a reconstructed multidimensional signal, data set, information, or image from the plurality of non-overlapping subsets or resolution levels, where the reconstructed multidimensional signal, data set, information, or image has enhanced boundary properties and has reduced noise.	paragraphs [0005], [0006], [0007], [0017-22] and Attachment A.
19. The method of claim 1, wherein the number of dimensions is greater than or equal to 2.	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.
20. The method of claim 1, wherein the number of dimensions is greater than or equal to 3.	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.
21. The method of claim 4, wherein the number of dimensions is greater than or equal to 2.	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.
22. The method of claim 4, wherein the number of dimensions is greater than or equal to 3.	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.
23. The method of claim 7, wherein the number of dimensions is greater than or equal to 2.	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.
24. The method of claim 7, wherein the number of dimensions is greater than or equal to 3.	paragraphs [0003],[0005], [0006], [0007], [0017-22] and Attachment A.

Because the provisional included the text of the Papadakis paper prior to it being published as an article – the Provisional Application was filed before publication – and because the provisional include fully support for all claims and claim elements, Applicants respectfully request withdrawal of this rejection.

Having fully responded to the Examiner's Non-Final Office Action, Applicants respectfully urge that this application be passed onto allowance.

If it would be of assistance in resolving any issues in this application, the Examiner is kindly invited to contact applicant's attorney Robert W. Strozier at 713.977.7000

The Commissioner is authorized to charge or credit Deposit Account 501518 for any additional fees or overpayments.

Respectfully submitted,

Date: **March 23, 2009**

/Robert W. Strozier/
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